

BELLCOMM, INC.

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SUBJECT: Review of Experiment
Implementation Plans for
Medical Experiments -
Case 610

DATE: January 14, 1969

FROM: M. S. Feldman

MEMORANDUM FOR FILE

A new set of Experiment Implementation Plans for medical experiments to be conducted on Apollo Applications Program missions have been prepared and submitted by MSC. These plans define the experiments in accordance with the reorganization and renumbering of medical experiments approved by the MSFEB meeting on November 20, 1967.

The experiments are organized into six functional categories designated governing protocols. Governing protocols with experiments to be contained in each protocol are shown in Table 1 - Organization of AAP Medical Experiments. Tables 2 and 3 provide cross references between the currently used AAP medical experiment numbering and nomenclature and the reorganized numbering and nomenclature.

References 1 through 12 are the EIP's prepared in the reorganized numbering and nomenclature system for medical experiments previously approved in the currently used system. References 13 and 14, EIP's for experiments M113 Blood Volume and Red Cell Life Span and M132 Neurological Experiment were submitted and approved by MSFEB in the new numbering system and therefore require no conversion.

Except for M051 and M052 which have been divided into three experiments each, the effect of the medical experiments reorganization on AAP is merely a change in experiment numbers and titles. The new EIP's provide more complete and current documentation on the medical experiments than was previously available. The hardware required and procedures involved for the total medical experiment complement has not changed as a result of the reorganization except for the minor addition of a periodic sweat sampling requirement included in M071 Mineral Balance experiment.

The EIP's show a large weight growth for two experiments. In comparing the November, 1968, AAP Weight and Performance Report to the EIP's, M-171 Metabolic Activity has increased from 122.3 to 150 pounds and M131 Human Vestibular Function has increased from 219 to 265 pounds. This is a 23% increase for M171 and a 21% increase for M131.

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(NASA-CR-104021) REVIEW OF EXPERIMENT
IMPLEMENTATION PLANS FOR MEDICAL EXPERIMENTS
(Bellcomm, Inc.) 6 P

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Apparent conflicts exist in scheduling the post flight procedures that are required to be accomplished as soon as possible after recovery. Table 4 summarizes these requirements and indicates the conflicts. These conflicts will have to be resolved by the medical experiment investigators before post flight timelines can be established.

The EIP's satisfy the AAP requirement for defining the medical experiments in the reorganized format. Therefore, the Apollo Applications Program should now implement the reorganized format for medical experiments.

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Attachments
Tables 1-4
References

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TABLE 1

Organization of AAP Medical Experiments

M070	Nutrition and Musculoskeletal Function Governing Protocol
M071	Mineral Balance Experiment
M072	Bone Densitometry Experiment
M073	Bioassay of Body Fluids Experiment
M074	Specimen Mass Measurement Experiment
M090	Cardiovascular Function Governing Protocol
M091	Lower Body Negative Pressure Experiment (Pre and Post Flight)
M092	Lower Body Negative Pressure Experiment (In Flight)
M093	Vectorcardiogram Experiment
M110	Hematology Governing Protocol
M111	Cytogenetic Studies of Blood Experiment
M112	Microbiological and Immunological Study Experiment (EIP not submitted)
M113	Blood Volume and Red Cell Life Span Experiment
M114	Blood Study Experiment (EIP not submitted)
M115	Blood Study Experiment (EIP not submitted)
M130	Neurophysiology Governing Protocol
M131	Human Vestibular Function Experiment
M132	Neurological Experiment - EEG
M150	Behavioral Effects Governing Protocol
M151	Time and Motion Study Experiment
M170	Pulmonary Function and Energy Metabolism Governing Protocol
M171	Metabolic Activity Experiment
M172	Body Mass Measurement Experiment

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TABLE 3

Medical Experiment Numbering and Nomenclature Cross Reference

Reorganized	Current
M071 Mineral Balance	M052 Bone and Muscle Changes
M072 Bone Densitometry	M052 Bone and Muscle Changes
M073 Bioassay of Body Fluids	M052 Bone and Muscle Changes
M074 Specimen Mass Measurement	M056 Specimen Mass Measurement Device
M091 Lower Body Negative Pressure (Pre and Post Flight)	M051 Cardiovascular Function
M092 Lower Body Negative Pressure (Inflight)	M051 Cardiovascular Function
M093 Vectorcardiogram	M018 Vectorcardiogram
M111 Cytogenetic Studies of Blood	M051 Cardiovascular Function
M113 Blood Volume and Red Cell Life Span	M113 Blood Volume and Red Cell Life Span
M131 Human Vestibular Function	M053 Human Vestibular Function
M132 Neurological Experiment - EEG	(Not previously approved)
M151 Time and Motion Study	M055 Time and Motion Study
M171 Metabolic Activity	M050 Metabolic Cost of Inflight Tasks
M172 Body Mass Measurement	M058 Body Mass Measurement Device

TABLE 4

Summary of Procedures to be Accomplished as Soon as Possible after Recovery

<u>Experiment</u>	<u>Procedure</u>	<u>Constraint</u>	<u>Conflicting Experiment</u>
M072 Bone Densitometry	X-ray heel and little finger	Perform immediately after suit doffing and prior to occurrence of other than minimal mandatory weight bearing on limbs or tilt test	M091, M093
M073 Bioassay of Body Fluids	Blood Sample	Prior to eating	M091
M091 LBNP (Pre and Post Flight)	LBNP test	Should not be preceded by venipuncture or physical exertion	M073, M093, M111, M113
M093 Vector-cardiogram	VCG at rest and during exercise	As soon as possible	
M111 Cytogenetic Studies of Blood	Blood Sample	To be taken prior to X-ray or isotope injection	M072, M113
M113 Blood Volume and Red Cell Life Span	Blood Samples Isotope Injections Scintillation counter over spleen and liver	Prior to eating Prior to exertion	M091, M093

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REFERENCES

1. EIP for M071 Mineral Balance, October 16, 1968.
2. EIP for M072 Bone Densitometry, May 15, 1968.
3. EIP for M073 Bioassay of Body Fluids, October 21, 1968.
4. EIP for M074 Specimen Mass Measurement, May 15, 1968.
5. EIP for M091 LBNP (Pre and Post Flight), August 1968.
6. EIP for M092 Inflight LBNP, August 1968.
8. EIP for M111 Cytogenetic Studies of Blood, June 26, 1968.
9. EIP for M131 Human Vestibular Function, July 1968.
10. EIP for M171 Metabolic Activity, April 26, 1968.
11. EIP for M172 Body Mass Measurement, April 26, 1968.
12. EIP for M151 Time and Motion Study, April 5, 1968.
13. EIP for M113 Blood Volume and Red Cell Life Span, May 8, 1968.
14. EIP for M132 Neurological Experiment - EEG, May 6, 1968.